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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/662,323
Filing Date: September 14, 2000
Appellant(s): MATSUI, SEIICHI

Marc Weiner
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 9/26/2006 appealing from the Office action mailed 8/25/2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is incorrect.

The amendment after final rejection filed on 12/22/2005 has been entered.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,342,921	Yamaguchi et al.	1-2002
6,108,036	Harada et al.	8-2000
6,040,869	Dischert	3-2000

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4-7, 9-12, 16-19, and 21-24 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al. in view of Harada et al. US 6,108,036.

Re claim 4, Yamaguchi discloses in figure 14 an image pickup device capable of both full frame operation and line thinning operation. It can be seen in figure 15A that pixel information of two adjoining lines of the array composes color information of three primary colors (R,G,B) (col. 13, lines 30-32). The image pickup device includes photosensors (2) for acquiring image signals and vertical transferring routes (3) for reading out image signals (col. 13, lines 32-44). The vertical transferring routes (3) include a matrix of transferring gates (21,22,23,31,32,33) associated with the individual photosensors (2) (col. 13, lines 44-52). Driving pulses (φ V1, φ V2, φ V2', φ V3) are applied to the gates (21,22,23,31,32,33) via bus wirings (41,42,42',43) in order to transfer signals from the photosensors (2) according to either a full-frame operation or a

line thinning operation (col. 13, line 48 – col. 15, line 4). During the line thinning operation only pixel information of certain photosensors (2) is readout and thus image signals with low definition are produced (fig. 16C; col. 14, line 46 – col. 15, line 4). The line thinning mode may be set so that only pixel information of pairs of two adjoining lines with intervals of a plurality of lines are transferred to the vertical transferring routes (3) thus reducing the number of output lines to half of the value (fig. 19, col. 16, lines 8-14). Additionally, Yamaguchi discloses a lens system (100) that forms a subject image on the CCD (101) (col. 5, lines 28-43). The image pickup device disclosed by Yamaguchi also includes a timing controller (107) for generating driving pulses for transferring pixel information according to the functions described above. However, Yamaguchi does not disclose a signal processing device that produces pixel information of one line from the pixel information of each pair of two adjoining lines when image signals of low definition are produced.

Harada discloses in figure 1 an imaging apparatus (1) including a solid imaging device (14-16) and an optical system (3). The imaging apparatus (1) disclosed by Harada includes a signal processing device (72) that produces image signals by producing pixel information of one line from the pixel information of a pair of two adjoining lines read from the solid imaging device (fig. 9; col. 34, lines 23-41). Therefore, it would have been obvious for one skilled in the art to have been motivated to include the signal processing device capable of producing image signals by producing pixel information of one line from the pixel information of a pair of adjoining lines as disclosed by Harada in the image pickup device capable of performing a line

thinning operation as disclosed by Yamaguchi. Doing so would provide a means for adding signals outputted from two adjacent light-receiving regions to generate a single output in each field (Harada: col. 34, lines 20-27).

Re claim 5, Yamaguchi states that the image pickup device may operate in a full-frame mode to readout signals of all pixels from the photosensors (2) to the vertical transferring routes (3) (col. 14, lines 8-16).

Re claim 6, when the image pickup device operates in full-frame mode the signals are divided into a plurality of fields (R,G,B) corresponding to the order of the array of color filters (col. 14, lines 8-16).

Re claim 7, the signal processing device (72) disclosed by Harada reduces pixel information of horizontal lines by producing pixel information of one line from the pixel information of pairs of adjoining lines by a process called interlacing (col. 34, lines 23-42; fig. 9).

Re claim 9, the image pickup device disclosed by Yamaguchi includes a liquid crystal display (135) for displaying color images read out according to either the full frame mode or the line-thinning mode (col. 8, lines 57-67).

Re claim 10, the image pickup device disclosed by Yamaguchi includes memory (143) that records the image signals produced by the image pickup device (col. 8, line 57 – col. 9, line 6).

Re claim 11, see claim 5.

Re claim 12, see claim 6.

Re claim 16, see claim 4.

Re claim 17, see claim 5.

Re claim 18, see claim 6.

Re claim 19, see claim 7.

Re claim 21, see claim 9.

Re claim 22, see claim 10.

Re claim 23, see claim 5.

Re claim 24, see claim 6.

Claims 8 and 20 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al. in view of Harada et al. and further in view of Dischert US 6,040,869.

Re claim 8, Yamaguchi in view of Harada discloses all of the limitations according to claim 4. In addition, the signal processing device (72) disclosed by Harada outputs the interlaced signals (col. 34, lines 20-23). However, Harada does not state that the signal processing device (72) has an interpolation operation device that interpolates the interlaced signals.

Dischert discloses in figure 1A video signal processing circuitry. The circuitry serves to interpolate interlaced lines (fig. 2D; col. 5, lines 57-65). Therefore, it would have been obvious to include the video signal processing circuitry as disclosed by Dischert in the solid imaging device disclosed by Yamaguchi in view of Harada. Doing so would provide a means for interpolating the interlaced signals with the low definition to produce modified image signals (Dischert: col. 5, lines 57-65).

Re claim 20, see claim 8.

(10) Response to Argument

On pages 8-10, 14, 17, 20-21, 23-24, and 26-27 of the Brief, Appellant states that the combination of the Yamaguchi and Harada references fails to teach or suggest all of the claim elements set forth in independent claims 4, 11-12, 16 and 23-24. Appellants arguments state that the "Harada reference discloses processing on light-receiving signal with another light-receiving signal. However, according to the teachings of Yamaguchi, one of the two lines read out is not a light receiving signal as one of the rows of pixels is not charged. As such in combining the teachings of the two references, the resultant device would produce pixel information of one line from the pixel information **of non-adjoining** lines. As such, Appellant maintains that the cited references, either alone or in combination, fail to teach or suggest "a signal processing device that produces the image signals by producing pixel information of one line from the pixel information of each pair of two adjoining lines read from said solid imaging device when the image signals with the low definition are produced". The Examiner respectfully disagrees.

Yamaguchi states that a line thinning mode may be set so that only pixel information of pairs of two adjoining lines with intervals of a plurality of lines are transferred to the vertical transferring routes (3) thus reducing the number of output lines to half of the value (figs. 19 and 20, col. 16, lines 8-14). **Yamaguchi states that the signal of only R is read out (thus G is dropped) in a first horizontal period (H1) and the signal of only G is read out (thus R is dropped) in a second horizontal period (H2) (col. 16, lines 15-32; figures 19 and 20). However, although in each of the two horizontal readout periods (H1,H2) only one of the signals is read out this**

does not teach that non-adjoining lines are read out. It can be seen in figure 20 that the R signal that is read out in the first horizontal period (H1) and the G signal that is read out in the second horizontal period (H2) reside on adjoining lines. Thus, Yamaguchi provides the teaching of transferring pixel information of pairs of two adjoining lines (the line containing R from period H1 and the line containing G from period H2) with intervals of a plurality of lines to vertical transferring routes. Harada discloses a signal-processing device (72) that produces image signals by producing pixel information of one line from the pixel information of a pair of two adjoining lines that are read from a solid imaging device during separate output fields (periods) (fig. 9; col. 34, lines 23-41). Therefore, the combination of the Yamaguchi and Harada references discloses all of the elements of independent claims 4, 11-12, 16 and 23-24.

On pages 11-12, 15, 18, 21, 24-25 and 27-28 of the Brief, Appellant states that the Examiner has failed to provide proper motivation in support of the rejection of independent claims 4, 11-12, 16 and 23-24. Appellant further states that because in the Yamaguchi reference only one line of pixels is energized when pairs are read out, there is no reason to average the two lines as taught by Harada. The Examiner respectfully disagrees.

Yamaguchi discloses in figure 14 an image pickup device capable of both full frame operation and line thinning operation. It can be seen in figure 15A that pixel information of two adjoining lines of the array composes color information of three

primary colors (R,G,B) (col. 13, lines 30-32). The image pickup device includes photosensors (2) for acquiring image signals and vertical transferring routes (3) for reading out image signals (col. 13, lines 32-44). The vertical transferring routes (3) include a matrix of transferring gates (21,22,23,31,32,33) associated with the individual photosensors (2) (col. 13, lines 44-52). Driving pulses (φ V1, φ V2, φ V2', φ V3) are applied to the gates (21,22,23,31,32,33) via bus wirings (41,42,42',43) in order to transfer signals from the photosensors (2) according to either a full-frame operation or a line thinning operation (col. 13, line 48 – col. 15, line 4). During the line thinning operation only pixel information of certain photosensors (2) is readout and thus image signals with low definition are produced (fig. 16C; col. 14, line 46 – col. 15, line 4). The line thinning mode may be set so that only pixel information of pairs of two adjoining lines with intervals of a plurality of lines are transferred to the vertical transferring routes (3) thus reducing the number of output lines to half of the value (fig. 19, col. 16, lines 8-14). **Yamaguchi also states that the signal of only R is read out (thus G is dropped) in a first horizontal period (H1) and the signal of only G is read out (thus R is dropped) in a second horizontal period (H2) (col. 16, lines 15-32; figures 19 and 20). However, although in each of the two horizontal readout periods (H1,H2) only one of the signals is read out this does not teach that non-adjoining lines are read out. It can be seen in figure 20 that the R signal that is read out in the first horizontal period (H1) and the G signal that is read out in the second horizontal period (H2) reside on adjoining lines. Thus, Yamaguchi provides the teaching of transferring pixel information of pairs of two adjoining lines (the line containing R**

from period H1 and the line containing G from period H2) with intervals of a plurality of lines to vertical transferring routes. Additionally, Yamaguchi discloses a lens system (100) that forms a subject image on the CCD (101) (col. 5, lines 28-43). The image pickup device disclosed by Yamaguchi also includes a timing controller (107) for generating driving pulses for transferring pixel information according to the functions described above. However, Yamaguchi does not disclose a signal processing device that produces pixel information of one line from the pixel information of each pair of two adjoining lines when image signals of low definition are produced.

Harada discloses in figure 1 an imaging apparatus (1) including a solid imaging device (14-16) and an optical system (3). The imaging apparatus (1) disclosed by Harada includes a signal processing device (72) that produces image signals by producing pixel information of one line from the pixel information of a pair of two adjoining lines read from a solid imaging device during separate output fields (periods) (fig. 9; col. 34, lines 23-41). Therefore, it would have been obvious for one skilled in the art to have been motivated to include the signal processing device capable of producing image signals by producing pixel information of one line from the pixel information of a pair of adjoining lines read from a solid imaging device during separate output fields as disclosed by Harada in the image pickup device capable of performing a line thinning operation by transferring pixel information of pairs of two adjoining lines as disclosed by Yamaguchi. **Doing so would provide a means for adding signals outputted from two adjacent light-receiving regions to generate a single output in each field and**

producing an effect for limiting vertical spatial frequency (Harada: col. 34, lines 20-27 and lines 51-59).

On pages 12, 15-16, 18-19, 22, 25 and 28 of the Brief, Appellant states that the Yamaguchi reference teaches away from the purported combination. In support of this, Appellant further states that in combining the teachings of the references, as suggested by the Examiner, Yamaguchi would effectively be processing one energized or charged row of pixels with one non-energized or non-charged row of pixels. The Examiner respectfully disagrees.

Yamaguchi states that a line thinning mode may be set so that only pixel information of pairs of two adjoining lines with intervals of a plurality of lines are transferred to the vertical transferring routes (3) thus reducing the number of output lines to half of the value (figs. 19 and 20, col. 16, lines 8-14). **Yamaguchi states that the signal of only R is read out (thus G is dropped) in a first horizontal period (H1) and the signal of only G is read out (thus R is dropped) in a second horizontal period (H2) (col. 16, lines 15-32; figures 19 and 20). However, although in each of the two horizontal readout periods (H1,H2) only one of the signals is read out this does not teach that non-adjoining lines are read out. It can be seen in figure 20 that the R signal that is read out in the first horizontal period (H1) and the G signal that is read out in the second horizontal period (H2) reside on adjoining lines. Thus, Yamaguchi provides the teaching of transferring pixel information of pairs of two adjoining lines (the line containing R from period H1 and the line**

containing G from period H2) with intervals of a plurality of lines to vertical transferring routes. Harada discloses a signal-processing device (72) that produces image signals by producing pixel information of one line from the pixel information of a pair of two adjoining lines that are read from a solid imaging device during separate output fields (periods) (fig. 9; col. 34, lines 23-41). Therefore, the combination of the Yamaguchi and Harada references discloses all of the elements of independent claims 4, 11-12, 16 and 23-24 and in combining the teaching of the references Yamaguchi would effectively be processing two energized rows of pixels (the line containing R from period H1 and the line containing G from period H2) and producing pixel information of one line fromt the pixel information of a pair of adjoining lines (the line containing R from period H1 and the line containing G from period H2).

On pages 13, 16, 19, 22, 25-26 and 28-29 of the Brief, Appellant states that the rejection of independent claims 4, 11-12, 16 and 23-24 relies on impermissible hindsight reasoning. The Examiner respectfully disagrees.

The motivational statement provided by the Examiner in the Final rejection is as follows: "Therefore, it would have been obvious for one skilled in the art to have been motivated to include the signal processing device capable of producing image signals by producing pixel information of one line from the pixel information of a pair of adjoining lines read from a solid imaging device during separate output fields as disclosed by Harada in the image pickup device capable of performing a line thinning operation by transferring pixel information of pairs of two adjoining lines as disclosed by Yamaguchi.

Doing so would provide a means for adding signals outputted from two adjacent light-receiving regions to generate a single output in each field (Harada: col. 34, lines 20-27)". The motivational statement provided by the Examiner comes directly from the Harada reference (col.34, lines 20-27). Additionally, the interlacing technique disclosed by the Harada reference is well known and used in the art and one skilled in the art would have been well versed with the interlace scanning technique disclosed by Harada. Therefore, the rejection of independent claims 4, 11-12, 16 and 23-24 does not rely on hindsight reasoning.

On pages 13 and 22-23 of the Brief, Appellant states that the rejection of dependent claims 5-7, 9-10, 17-19 and 21-22 are allowable for the reasons set forth above with regard to claims 4 and 16. Therefore, the Examiner's responses above regarding claims 4 and 16 are also relevant to dependent claims 5-7, 9-10, 17-19 and 21-22.

On pages 29-30 of the Brief, Appellant states that the rejection of dependent claims 8 and 20 are allowable for the reasons set forth above with regard to claims 4 and 16 respectively. Therefore, the Examiner's responses above regarding claims 4 and 16 are also relevant to dependent claims 8 and 20.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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